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1. **Scope**

This Standard Operating Procedure (SOP) applies to the staff and students using the Riester big ben® Aneroid Sphygmomanometer in the Pharmacy Practice Resource Unit (PPRU) at the Pharmacy Department, University of Malta.

2. **Objective**

To describe the procedure for the operation and maintenance of the Riester big ben® Aneroid Sphygmomanometer.

3. **Definitions**

3.1. **Aneroid Sphygmomanometer**: A device used to measure blood pressure. It consists of an inflatable cuff, a hand pump with a deflator valve and a dial gauge to display the obtained blood pressure readings.

3.2. **Bladder**: The inflatable bag found inside the cuff.

3.3. **Diastolic Blood Pressure**: The maximum pressure being exerted when the heart is contracting.

3.4. **Manometer**: A pressure-measuring device.

3.5. **Systolic Blood Pressure**: The minimum pressure in the arteries when the heart is at rest.

4. **Responsibility**

4.1. The members of the Department of Pharmacy (staff and students) are responsible for following this SOP.

4.2. The designated Laboratory Officer or Laboratory Assistant is responsible for ensuring that this SOP is followed.
5. Procedure

5.1. Operation

5.1.1. Bare the patient’s left/right upper arm.
5.1.2. Place the cuff 2-3cm above the bend of the elbow on the bare left/right upper arm.
5.1.3. Check that the Ø symbol is above the artery.
5.1.4. Close the cuff by means of the Velcro fastener if using a Velcro-type cuff.
5.1.5. Insert the metal hook into the appropriate metal bar if using a hook-type cuff.
5.1.6. Check that two fingers can still be inserted between the arm and the cuff.
5.1.7. Connect the coiled tube extension to the manometer.
5.1.8. Attach the loose tube of the cuff to the coiled tube via the connecting piece.
5.1.9. Instruct the patient to lay his or her arm on a table with palm turned upwards and to keep still during the measurement.
5.1.10. Place the stethoscope chest piece below the cuff so that the membrane of the chest piece is resting against the inside of the bicep, where the artery is located.
5.1.11. Rotate the air-release screw clockwise to check that it is closed.
5.1.12. Squeeze the hand bulb until the cuff pressure is 20-30 mmHg higher than the maximum expected blood pressure.
5.1.13. Gently rotate the air-release screw anticlockwise to slowly start to release the air from the cuff. The cuff will deflate at a rate of 2-3 mmHg/second.
5.1.14. Check that the pointer is moving at a rate of 1-1.5 graduations/second on the dial.
5.1.15. Record the value obtained when the first rhythmical thumping sound is heard. This corresponds to the systolic blood pressure.
5.1.16. Record the value obtained when the thumping sound stops. This corresponds to the diastolic blood pressure.
5.1.17. Open the air-release valve completely to deflate the cuff.
5.2. Maintenance

5.2.1. Wipe the manometer, the cuff, the bladder, the adjoining tubes and the bulb with a moist cloth.

5.2.2. Disinfect cuffs in cold water together with an added disinfectant, after which the bladder has been removed.

5.2.3. Disinfect the bladder and the tubes with a moist cloth containing ethanol.

5.2.4. Remove all tubes from the manometer and hold the device in a vertical position to check the precision of the manometer.

5.2.5. Check that the pointer stands still at 0 on the scale. If the pointer is below or above 0, device must be recalibrated by the supplier.
5.3. Flow Chart

5.3.1. Operation

Start

Bare patient’s left/right upper arm

Place cuff 2-3cm above bend of elbow

Check that Ø symbol is above the artery

Using Velcro-type cuff

Close cuff by means of Velcro fastener

Check that 2 fingers can still be inserted between arm and cuff

Connect coiled tube extension to manometer

Attach loose tube of cuff to the coiled tube

Instruct patient to lay his/her arm on table with palm turned upwards and to keep still during measurement

Place stethoscope chest piece below cuff so that membrane of chest piece is resting against the inside of bicep

Rotate air-release screw clockwise to check that it is closed

1

No

Use hook-type cuff and insert metal hook into appropriate metal bar
1. Squeeze hand bulb until cuff pressure is 20-30 mmHg higher than the maximum expected blood pressure.

2. Gently rotate air-release screw anticlockwise to slowly start to release air from cuff.

3. Check that pointer is moving at a rate of 1-1.5 graduations/sec.

4. Record value obtained when first rhythmical thumping sound is heard. This corresponds to systolic blood pressure.

5. Record value obtained when thumping sound stops. This corresponds to diastolic blood pressure.

6. Open air-release valve completely to deflate cuff.

End
5.3.2. Maintenance

Start

Wipe manometer, bladder, adjoining tubes and bulb with a moist cloth

Need to disinfect cuff
Yes
Remove bladder
Place cuff in cold water together with an added disinfectant
Remove all tubes from manometer and hold it in a vertical position to check its precision

Need to disinfect bladder and/or tubes
Yes
Use a moist cloth containing ethanol

Yes

No

No

Pointer stands still at 0 on scale
Yes
Manometer is precise

No

Device must be re-calibrated by supplier

End
6. Precautions

6.1. Medical Device

6.1.1. Avoid damaging the rubber parts with sharp, cutting objects.
6.1.2. Do not expose the sphygmomanometer to extremes of temperature.
6.1.3. Do not scrub, machine wash, iron or dry clean the cuff.

6.2. Accurate Measurement

6.2.1. Ensure that the correct cuff size is being used to obtain precise blood pressure readings.
6.2.2. Ensure that the patient is relaxed, still and is not speaking when measurement is being taken.
6.2.3. Wait for 5 minutes until the pulse rate returns to normal, if the patient had been active, before taking readings.
6.2.4. Ensure that the patient is sitting down and that the cuff is positioned at heart level when taking readings.
6.2.5. Ensure that the measurements are performed on a bare arm, as circulation could be restricted.
6.2.6. Ensure that the cuff is not too tight or too loose fitting as inaccurate readings may result.
6.2.7. Wait 3-4 minutes between successive readings.

7. References


8. Appendices

N/A

9. Revision History

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